

4361e

A CITIZEN'S GUIDE TO  
AIRBORNE CONTAMINANT REPORTING  
IN ONTARIO

In Support of  
ONTARIO REGULATION 127/01

ONTARIO MINISTRY OF THE ENVIRONMENT  
November 2002



P1BS 4361e

**A CITIZENS' GUIDE TO  
AIRBORNE CONTAMINANT REPORTING IN ONTARIO**

**IN SUPPORT OF**

**ONTARIO REGULATION 127/01**

*(AIRBORNE CONTAMINANT DISCHARGE - MONITORING AND REPORTING)*

**ONTARIO MINISTRY OF THE ENVIRONMENT**

**NOVEMBER 2002**



# A CITIZENS' GUIDE TO AIRBORNE CONTAMINANT REPORTING IN ONTARIO

## Table of Contents

|   | Page |
|---|------|
| Part 1: The Citizens' Guide   | 3    |
| Part 2: The Development of Airborne Contaminant Reporting   | 4    |
| • Why Airborne Contaminant Reporting?   | 4    |
| • The Development of the Current Reporting System   | 4    |
| Part 3: Understanding Airborne Contaminant Reporting  | 5    |
| • Who must report?  | 5    |
| • What substances must be reported?   | 7    |
| • What information must the reporter provide?   | 9    |
| • When must the reports be provided?  | 10   |
| • How can the public gain access to the reports?  | 11   |
| Part 4: Canada's National Pollutant Release Inventory (NPRI) and Ontario<br>Regulation 127/01 (O. Reg. 127/01)  | 12   |
| Part 5: Conclusion  | 13   |
| Glossary  | 14   |
| Appendix 1: Source Sectors for Airborne Contaminant Discharge Reporting   | 15   |
| Appendix 2a: Airborne Contaminants with MOE Release Based Thresholds  | 27   |
| Appendix 2b: Airborne Contaminants with MOE Graded Manufactured,<br>Produced or Otherwise Used (MPO) Thresholds | 28   |
| Notes to Appendices 2a and 2b   | 31   |
| Annex 1 to Appendix 2a      (Definition of Volatile Organic Compounds)  | 33   |
| Annex 1 to Appendix 2b      (Contaminants Listed under Glycol Ethers)   | 35   |
| Annex 2 to Appendix 2b      (The Three Mineral Spirits Groups)  | 36   |
| Appendix 3: Contact   | 37   |



## PART 1: THE CITIZENS' GUIDE

The Ontario government requires the owners and operators of approximately 5,000 facilities across the province in the industrial, commercial, institutional and municipal sectors to report on over 350 contaminants that they release to the air. As well as reporting this information to the provincial government, these facilities are required to make their reports available to any member of the public. The reporting organization (facility) is responsible for the validity and quality of its reported data.

The purpose of the *Citizens' Guide* is to help members of the public understand the air contaminants reporting system and to indicate how they can gain access to the information. The *Guide* describes who is required to report, what substances are reported, when the information must be reported, what is done with the reports and how the public can gain access to the reports.

The Ministry of the Environment gratefully acknowledges the work of the Canadian Institute for Environmental Law and Policy for their assistance in the preparation of this document.

This *Citizens' Guide* is for those who wish to gain access to and use the data that are reported. It is not a guide for those who do the reporting. The latter purpose is fulfilled by the provincial government's *Step by Step Guideline for Emission Calculation, Record Keeping and Reporting for Airborne Contaminant Discharge*; available at [www.ene.gov.on.ca/envision/monitoring/monitoring.htm](http://www.ene.gov.on.ca/envision/monitoring/monitoring.htm).

The information in *Guide* reflects Ontario's current reporting system, and addenda and revisions will be made as required.

## **PART 2: THE DEVELOPMENT OF AIRBORNE CONTAMINANT REPORTING IN ONTARIO**

### **Why Airborne Contaminant Reporting?**

Ontario's reporting system is to ensure that Ontario's residents have access to information on contaminants being released to the air in their communities.

An informed public will be better positioned to encourage companies and governments to take the actions needed to clean up Ontario's air. The information will also put the public in a better position to be able to make informed decisions in their personal lives that will result in cleaner air. For example, increased awareness of the pollutants released through power generation could stimulate the public to reduce their use of energy by adopting better conservation practices.

### **The Development of the Current Reporting System**

Ontario has been monitoring and reporting on air quality throughout the province since the 1970s. However, information on the sources of the contaminants affecting air quality has been limited. But this information is essential for Ontario to make the proper decisions to improve air quality.

Therefore, in January 2000, the Ontario government announced plans to pass regulations requiring the owners and operators of certain types of facilities to report their air releases to the provincial government and to the public.

The first step in this strategy was the passing of Ontario Regulation 227/00 (O. Reg. 227/00), which required the electricity sector to report its emissions of 28 specified air pollutants provided their emissions met or exceeded the thresholds defined in the regulation. This regulation came into effect on May 1, 2000.

The second step was the passing of O. Reg. 127/01, which extended the monitoring and reporting requirements beyond the electricity sector to a wide range of industrial, commercial, institutional and municipal sectors. It also increased the number of substances for which reporting is mandatory to over 350 pollutants. This regulation came into effect for the larger source sectors on May 1, 2001 and for facilities belonging to smaller source sectors on January 1, 2002. O. Reg. 127/01 includes the provisions of O. Reg. 227/00 within it and as a result, replaces that regulation.

## PART 3: UNDERSTANDING AIRBORNE CONTAMINANT REPORTING

In this part of the *Citizens' Guide*, the following questions will be answered:

- Who must report?
- What substances must be reported?
- What information must the reporter provide?
- When must the reports be provided?
- How can the public gain access to the reports?

### Who must report?

The owners and operators of all specified Ontario facilities are required to assess whether they meet certain reporting criteria. If they meet these criteria, they are required to report their airborne contaminant emissions.

Failure to follow the requirements of the *Airborne Contaminant Discharge Monitoring and Reporting Regulation (O. Reg. 127/01)* can result in prosecution under Ontario's *Environmental Protection Act*.

### Types of facilities:

Three classes of facilities are specified under O. Reg. 127/01:

- Class A: Electricity Generation;
- Class B: Sectors that contain large sources; and,
- Class C: Sectors that contain small sources.

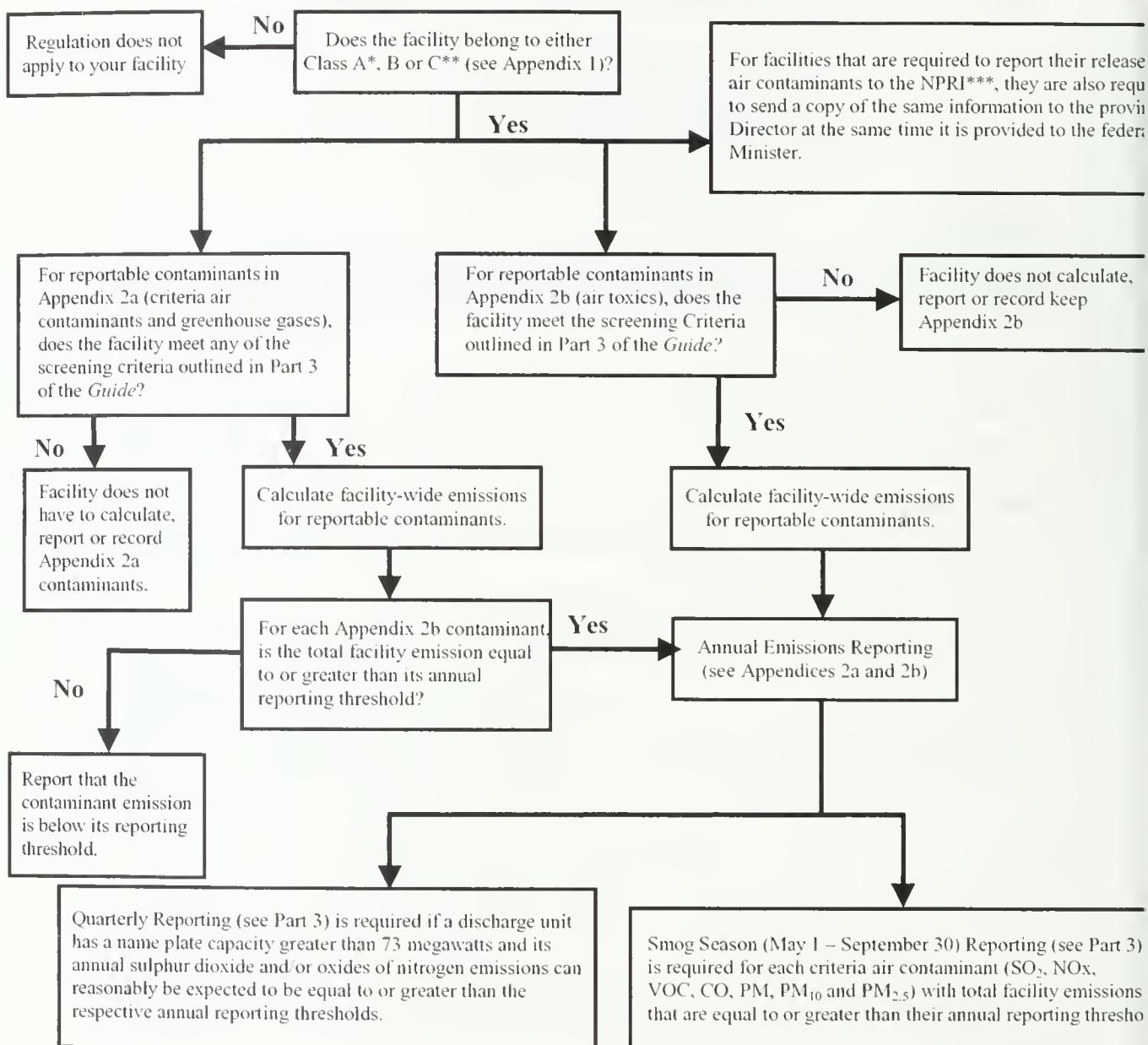
The detailed list of these facilities is in Appendix 1. If a facility that you are interested in is not one of the types listed in Appendix 1, the owner or operator of that facility is not required by O. Reg. 127/01 to provide you with their airborne release data.

Class A facilities were required to begin monitoring 28 airborne pollutants after May 1, 2000 (O. Reg. 227/00). Class A and B facilities were required to begin monitoring releases of over 350 pollutants after May 1, 2001 (O. Reg. 127/01). Class C facilities were required to begin monitoring their releases after January 1, 2002 (O. Reg. 127/01).

As of January 2002, there is no difference in the monitoring requirements for Class A, B or C facilities. The only reason you would need to distinguish between these classes is if you want to know whether a facility has to provide you with data for its releases before January 2002.

If a facility listed in Appendix 1 does not meet the reporting criteria, it will be exempted from reporting. Figure 1 summarizes the process that an owner or operator of a facility in Appendix 1 goes through to decide whether it is required to report.

**Figure 1: Quick Reference for Reporting**



\* For Class A facilities, this regulation does not apply to a generation facility that has a generating capacity of 1MW or less, or that sells 10 percent or less of its total electricity generated to the Independent Market Operator administered markets.

\*\* If the facility belongs to Class C, the gathering of emissions data will begin January 1<sup>st</sup>, 2002.

\*\*\* The NPRI contaminants are listed at website: <http://www.ec.gc.ca/pdb/npri>

## **What substances must facilities report?**

Ontario has three lists of substances that facilities may have to report on, provided they meet certain criteria: National Pollutant Release Inventory (NPRI) substances, criteria air pollutants and greenhouse gases, and air toxics. These substances were chosen to address a broad range of air issues.

**NPRI substances:** Provided they meet the reporting criteria, Ontario facilities listed in Appendix 1 must submit a copy of the air releases data from their NPRI report to the Ontario government. As of the 2001-reporting year, the NPRI air pollutant list was made up of 265 substances, which may be obtained through Environment Canada's NPRI website at <http://www.ec.gc.ca/pdb/npri>.

**Criteria air contaminants and greenhouse gases:** Ontario requires facilities to report on the following criteria air contaminants and greenhouse gases: oxides of nitrogen (NO<sub>x</sub>), airborne particulate matter (PM), sulphur dioxide (SO<sub>2</sub>), volatile organic compounds (VOCs), carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), hydrofluorocarbon-134A (HFC-134A), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O).

If a facility meets at least one of the following criteria, it will be required to determine its airborne contaminant releases each year for the specified criteria air contaminants and greenhouse gases.

- The facility can reasonably be expected to use coal, refuse, wood or waste oil as a fuel at any time during the year.
- The facility can reasonably be expected to have, at any time during the year, a name plate (rated) capacity of greater than 3 million British thermal units (BTUs) per hour.
- The facility can reasonably be expected to use 3,000 kilograms (kg) or more of solvents during the year.
- The facility can reasonably be expected to use 3,000 kg or more of coating materials during the year.
- The facility can reasonably be expected to use 3,000 kg or more of printing ink during the year.
- The facility can reasonably be expected to use 5,000 kg or more of welding rods or welding wires during the year.

Once the facility has made its air emission calculations, it will have to submit a report detailing these releases, if the individual amount released during the year is equal to or greater than the respective threshold set by the province. Appendix 2a lists the reporting thresholds for each of the criteria air contaminants and greenhouse gases.

For example, a facility does not have to report the quantity of carbon dioxide if it released less than 100 million kg (i.e., 100,000 tonnes) during the year; by contrast, a facility has to report the quantity if it has released at least 10 kg (i.e., 0.01 tonnes) of HFC-134A.

The reporting thresholds have been set with the objective of capturing 90% of the releases of criteria air contaminants and greenhouse gases from all the facilities listed in Appendix 1.

For individual reporting facilities, the *Step-By-Step Guideline* specifies a due diligence provision that states:

*For the purpose of reporting under this regulation, it is intended that for any given contaminant whose emissions are equal to or greater than its respective reporting threshold, at least 95% of the facility's total emissions are to be accounted for.*

Even if the quantities of criteria air contaminants and greenhouse gases released during the year were below the threshold, the facility must submit a report that says these emissions were below the threshold, but it does not have to specify the quantity released.

**Air Toxics:** Ontario requires reporting on 76 air toxics (Appendix 2b). Some of these air toxics are not on the NPRI list whereas others on the NPRI list have been put on Ontario's air toxic list for one or both of the following reasons:

- the substance is more precisely defined in the Ontario case.
- the NPRI reporting threshold is less stringent than Ontario's. For example, for all of the 76 air toxics, Ontario requires reporting below the NPRI's threshold of 10,000 kilograms manufactured, processed or otherwise used (MPO) during the year. For 35 of these substances, Ontario has a threshold of 3,000 kg MPO during the year; for another 35 substances, the threshold is 500 kg per year. For the remaining six substances, the thresholds are either 5 kg each year or 0.0001 kg each year.

A facility listed in Appendix 1 has to calculate and report its releases of these 76 air toxics if it meets both of the following criteria:

- the facility can reasonably be expected to employ or engage persons who work a cumulative total of 20,000 hours or more during the year.
- the contaminant can reasonably be expected to be MPO at the facility during the year in an amount equal to or greater than the threshold amount for the contaminant listed in Appendix 2b.

Ontario has set these reporting criteria at a level that it expects will result in reporting on at least 80% of the total air toxics released from all the facilities listed in Appendix 1. As stated earlier, for individual reporting facilities, the *Step-By-Step Guideline* says that 95% of the facility's total emissions should be accounted for.

## **Two cautions:**

The users of these data should exercise caution in aggregating reported contaminant emissions in order to avoid misinterpretations.

**Caution 1 — Avoid Double Counting:** The list of over 350 pollutants listed in O. Reg. 127/01 includes both individual pollutants (e.g., toluene) and contaminant groups and compounds (e.g., VOCs). Therefore toluene should not be summed with total VOCs because the total VOCs value should already include toluene.

**Caution 2 — Consider Differing Impacts:** Since not all substances have the same effects on the environment and on human health, it is not appropriate to sum up all the emissions to generate a single value to indicate the magnitude of the effect on the environment or human health.

Simply adding up all the reports from a facility to get a total release may also result in double counting. In addition, year-to-year comparisons of releases at a facility or comparisons among facilities of total releases usually do not result in a good basis for making decisions about environmental and health impacts or the relative significance of releases.

Therefore when you make comparisons, you should first decide what kinds of environmental or health effects you want to focus on.

## **What information must the reporter provide?**

The reporter must include information about the location of the facility, and the name and address of the organization that owns the facility. The reporter must also include contact information about the person who prepared the report.

Reporters for facilities in the electricity sector must also describe:

- the design capacity of the facility;
- the type of energy source: e.g., fossil fuel, hydro-electric, geothermal, nuclear, solar or wind;
- the fuel type used: e.g., the kind of coal or gas; and
- the amount of electricity generated at the facility each year and during the smog season (from May 1 to September 30).

Reporting is done on a facility-wide basis for each substance. For each substance, the following pieces of information must be included in the report:

- the total amount of emissions over the reporting period;
- the "mode of releases" of emissions; and
- the "estimation method."

The "mode of releases" refers to the way in which the pollutant was released to the air. The pollutant may have been released directly from a stack at the facility or as a result of substances vapourizing while in storage or during loading and unloading. The release to

the air could also be the result of fugitive emissions from leaks at the facility, pollutants rising from roads on the facility site, or spills.

The “estimation method” refers to the way in which the owner or operator of the facility determines how much of each contaminant was released to the air. These methods include:

- continuous emission monitoring;
- predictive emission monitoring;
- source testing;
- mass balance;
- emission factors;
- emission estimation models; and
- engineering calculations.

Usually the data are not the result of continuous emission monitoring since this would be very difficult to do, if technically possible at all, and very expensive. The emissions data are more frequently the product of calculations based on knowledge about the level of activity at the facility, occasional monitoring at the site and experience in similar operations. This allows the operator of the facility to arrive at an estimate of the level of emissions.

### **When must the reports be provided?**

Ontario has three timings for reports.

- 1) An annual report is required for each of the pollutants covered in O. Reg. 127/01 provided the facility meets the reporting criteria and thresholds. The report covers January 1 to December 31 of each calendar year and must be submitted to the province and made available to the public by June 1 of the following year. Because O. Reg. 127/01 came into effect on May 1, 2001, the annual report for the year 2001 covers only the May 1 to December 31 period. The annual thresholds are reduced by one-third for 2001 to match the reduced reporting year. The emissions to air portion of the NPRI substances are reported to the ministry as reported to the NPRI (i.e., reporting and thresholds are for the 12-month period for 2001). For subsequent reporting years, annual reporting will cover the full 12-month period.
- 2) Facilities also must submit a report on the amount of certain smog contributing pollutants ( $\text{SO}_2$ ,  $\text{NO}_x$ , VOCs, CO, PM,  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$ ) that they released during Ontario’s smog season, which is defined as from May 1 to September 30. This smog season report must also be submitted by June 1 of the following year.
- 3) In addition to providing an annual report and a smog season report, facilities are required to submit quarterly reports on their releases of  $\text{NO}_x$  and  $\text{SO}_2$ . The quarterly reports must be submitted within 60 days after the end of each quarter.

The facility must provide these quarterly reports if it has a discharge unit with the capacity to use 73 megawatts of total energy input (i.e., a name plate capacity of 73

megawatts) and can be expected to release at least 20 tonnes of SO<sub>2</sub> and/or 14 tonnes of NO<sub>x</sub> (expressed as NO) during the full year.

The quarterly report must include information on the discharge unit. This information must include the capacity of the unit, the type of activity at the unit, the type of energy source and the fuel used. It also must include information for SO<sub>2</sub> and NO<sub>x</sub> on the total quarterly release, the estimation method, the emission control device and the average emission rate.

### **How can the public gain access to the report?**

Facility owners and operators must submit their reports to the Ontario Ministry of the Environment by the required reporting dates.

At the same time, reporters must ensure that their reports are available to any member of the public. Reports must be provided to the public, upon request, without any charge to the person who requests the report. Reports are to be available in either hard or electronic copies.

The owner or operator of the facility is required to ensure that each report is kept publicly available for at least seven years.

The totals for the airborne contaminant releases that are provided in these reports are based upon numerous calculations. The owner or operator of the facility must keep the information used to arrive at the totals for at least seven years. These records must be available to the provincial government for inspection at any time. The owner or operator does not, however, have to make these records available to the public.

If you wish to obtain a copy of an annual, smog season or quarterly report, you should contact the owner or operator of the facility that you are interested in. Some facilities may post these reports on their web site.

The ministry has also established a central Internet Web site where the public can access these reports. This Web site is available through a hotlink on the ministry's homepage at <http://www.ene.gov.on.ca>.

## **Part 4: CANADA'S NATIONAL POLLUTANT RELEASE INVENTORY (NPRI) AND ONTARIO REGULATION 127/01 (O. Reg. 127/01)**

In January 1993, Canada's National Pollutant Release Inventory (NPRI)<sup>1</sup> came into effect requiring facilities to report each year on their releases of certain pollutants to air, water and land. These facilities must also report their transfers of these substances to other facilities for recycling or disposal.

The NPRI and O. Reg. 127/01 are similar but yet differ in several significant respects.

- The pollutants covered are more numerous in Ontario's reporting system. As of the 2001-reporting year, Ontario's system requires reporting on over 350 airborne contaminants in comparison with the 265 required by the NPRI.
- The reporting thresholds differ between the two systems for some substances.
- O. Reg. 127/01 requires reporting only on releases to air in contrast with the NPRI's requirements for reporting on releases to all three media (air, water and land), and on transfers off-site.

The Ontario and federal governments are working together to reduce potential confusion and duplication for reporters to the two systems and for users of the data. The objective is to develop a joint reporting system to allow for a one-window approach to reporting.

---

<sup>1</sup>The NPRI Internet site is [www.ec.gc.ca/pdb/npri](http://www.ec.gc.ca/pdb/npri).

## PART 5: CONCLUSION

Ontario's airborne contaminants reporting system is aimed at helping citizens better understand the sources of air pollutants and to help them participate in decision-making to address these issues. However by itself, O. Reg. 127/01 can not give a complete picture of the sources of air contamination in Ontario.

The Ontario reporting system does not include the air contaminants released from sources outside of Ontario. These sources can be responsible for a significant proportion of the air contaminants impacting our province. For example, more than 50 percent of the acid rain and smog-causing substances in Ontario's air come from sources in the United States.

The system also does not report on all air pollution sources within Ontario. For example, air contaminants from the exhaust pipes of motor vehicles are not included. This is usually the largest local source of smog-causing pollutants.

O. Reg. 127/01 is designed to collect air emissions data specifically from stationary sources. The Ministry of the Environment uses other methods to estimate emissions from mobile sources. The Ministry also has programs to control emissions from mobile sources, such as *Drive Clean*.

Nevertheless, Ontario's airborne contaminant reporting system provides you with substantial quantities of significant information from approximately 5,000 industrial, commercial, institutional and municipal facilities in Ontario.

We hope that this *Citizens' Guide to Airborne Contaminant Reporting in Ontario* will help you access and understand this information so that you can use it in your efforts to clean up and protect Ontario's air.

## GLOSSARY

**“Facility”** includes all buildings, equipment, structures or other stationary items that are located on a single site or on adjacent sites and that are owned by the same company and operated as a single integrated site.

**“MPO”** means manufacture, process or otherwise use.

**“Manufacture”** means to produce or prepare a compound that contains a designated substance. It also includes the incidental production of a substance as a by-product as a result of another substance being manufactured, processed or otherwise used. This latter situation is sometimes referred to as “incidentally manufactured.”

**“Process”** means the preparation of a designated substance after its manufacture for distribution in commerce, or the use of a designated substance as part of a chemical or physical process. Processing includes preparation of a substance with or without changes in physical state or chemical form. The term also applies to the processing of materials, mixtures or formulations that contain a designated substance as one component. See definition of “otherwise used” for more detail.

**“Otherwise use”** refers to any use of a designated substance at a facility that does not fall under the definitions of “manufacture” or “process.” This includes the use of the substance as a chemical processing aid, a manufacturing aid or some other ancillary use, such as using trichloroethylene to degrease tools, using metal-cutting fluid that contains diethanolamine or using a heat-transfer fluid containing biphenyl. It does not include janitorial or facility grounds maintenance. Nevertheless, substances used in the maintenance of equipment used for manufacturing and processing at the facility are considered “otherwise used,” e.g., solvents for cleaning machines.

**“Releases”** refers to pollutants that are discharged directly at the facility into the air. This is the total of releases from stacks, vents, etc., plus releases to the air as a result of storing or handling the material, plus fugitive releases through leaking pipes, evaporation from surface impoundments, etc., plus spills.

## Appendix 1

### Source Sectors for Airborne Contaminant Discharge Reporting

| SECTOR DESCRIPTION WITH NAICS* CODES                           |  |
|--|--|
| <b>CLASS A - ELECTRICITY GENERATION</b>                        |  |
| <i>ELECTRIC POWER GENERATION</i>                               |  |
| 221111* Hydro-Electric Power Generation                        |  |
| 221112 Fossil-Fuel Electric Power Generation                   |  |
| 221113 Nuclear Electric Power Generation                       |  |
| 221119 Other Electric Power Generation                         |  |
| <b>CLASS B - LARGE SOURCES</b>                                 |  |
| <i>METAL ORE MINING</i>  |  |
| 212210 Iron Ore Mining   |  |
| 212220 Gold and Silver Ore Mining                              |  |
| 212231 Lead-Zinc Ore Mining                                    |  |
| 212232 Nickel-Copper Ore Mining                                |  |
| 212233 Copper-Zinc Ore Mining                                  |  |
| 212291 Uranium Ore Mining                                      |  |
| 212299 All Other Metal Ore Mining                              |  |
| <i>NON-METALLIC MINERALS MINING AND QUARRYING</i>              |  |
| 212314 Granite Mining and Quarrying                            |  |
| 212315 Limestone Mining and Quarrying                          |  |
| 212316 Marble Mining and Quarrying                             |  |
| 212317 Sandstone Mining and Quarrying                          |  |
| 212323 Sand and Gravel Mining and Quarrying                    |  |
| 212326 Shale, Clay and Refractory Mineral Mining and Quarrying |  |
| 212394 Asbestos Mining   |  |
| 212395 Gypsum Mining   |  |
| 212396 Potash Mining   |  |
| <i>NATURAL GAS DISTRIBUTION</i>                                |  |
| 221210 Natural Gas Distribution                                |  |
| <i>WATER, SEWAGE AND OTHER SYSTEMS</i>                         |  |
| 221330 Steam and Air-Conditioning Supply                       |  |
| <i>TEXTILE MILLS AND TEXTILE MILL PRODUCTS</i>                 |  |
| 313110 Fibre, Yarn and Thread Mills                            |  |
| 313210 Broad-Woven Fabric Mills                                |  |
| 313310 Textile and Fabric Finishing                            |  |
| 313320 Fabric Coating  |  |
| 314110 Carpet and Rug Mills                                    |  |
| <i>WOOD PRODUCT MANUFACTURING</i>                              |  |
| 321111 Sawmills (except Shingle and Shake Mills)               |  |
| 321112 Shingle and Shake Mills                                 |  |

## SECTOR DESCRIPTION WITH NAICS\* CODES

- 321114 Wood Preservation
- 321211 Hardwood Veneer and Plywood Mills
- 321212 Softwood Veneer and Plywood Mills
- 321215 Structural Wood Product Manufacturing
- 321216 Particle Board and Fibreboard Mills
- 321217 Waferboard Mills
- 321911 Wood Window and Door Manufacturing

### **PULP, PAPER AND PAPERBOARD MILLS**

- 322111 Mechanical Pulp Mills
- 322112 Chemical Pulp Mills
- 322121 Paper (except Newsprint) Mills
- 322122 Newsprint Mills
- 322130 Paperboard Mills

### **CONVERTED PAPER PRODUCT MANUFACTURING**

- 322211 Corrugated and Solid Fibre Box Manufacturing
- 322212 Folding Paperboard Box Manufacturing
- 322219 Other Paperboard Container Manufacturing
- 322220 Paper Bag and Coated and Treated Paper Manufacturing
- 322230 Stationery Product Manufacturing
- 322291 Sanitary Paper Product Manufacturing

### **PRINTING AND RELATED SUPPORT ACTIVITIES**

- 323113 Commercial Screen Printing
- 323116 Manifold Business Forms Printing
- 323119 Other Printing (Includes Commercial Lithographic, Gravure and Flexographic Printing)

### **PETROLEUM REFINING AND DISTRIBUTION**

- 324110 Petroleum Refineries
- 412110 Petroleum Product Wholesaler-Distributors  
*(For gasoline bulk plants and terminals only)*

### **ASPHALT, OTHER PETROLEUM AND COAL PRODUCTS**

- 324121 Asphalt Paving Mixture and Block Manufacturing
- 324122 Asphalt Shingle and Coating Material Manufacturing
- 324190 Other Petroleum and Coal Products Manufacturing

### **CHEMICAL MANUFACTURING**

- 325110 Petrochemical Manufacturing
- 325120 Industrial Gas Manufacturing
- 325130 Synthetic Dye and Pigment Manufacturing
- 325181 Alkali and Chlorine Manufacturing
- 325189 All Other Basic Inorganic Chemical Manufacturing
- 325190 Other Basic Organic Chemical Manufacturing
- 325210 Resin and Synthetic Rubber Manufacturing
- 325220 Artificial and Synthetic Fibres and Filaments Manufacturing
- 325313 Chemical Fertilizer (except Potash) Manufacturing
- 325314 Mixed Fertilizer Manufacturing

**SECTOR DESCRIPTION WITH NAICS\* CODES**

|        |   |
|--------|---|
| 325320 | Pesticide and Other Agricultural Chemical Manufacturing |
| 325410 | Pharmaceutical and Medicine Manufacturing               |
| 325510 | Paint and Coating Manufacturing                         |
| 325520 | Adhesive Manufacturing                                  |
| 325610 | Soap and Cleaning Compound Manufacturing                |
| 325620 | Toilet Preparation Manufacturing                        |
| 325910 | Printing Ink Manufacturing                              |
| 325920 | Explosives Manufacturing                                |
| 325991 | Custom Compounding of Purchased Resins                  |
| 325999 | All Other Miscellaneous Chemical Product Manufacturing  |

**PLASTICS AND RUBBER PRODUCTS MANUFACTURING**

|        |  |
|--------|--|
| 326111 | Unsupported Plastic Bag Manufacturing                              |
| 326114 | Unsupported Plastic Film and Sheet Manufacturing                   |
| 326121 | Unsupported Plastic Profile Shape Manufacturing                    |
| 326122 | Plastic Pipe and Pipe Fitting Manufacturing                        |
| 326130 | Laminated Plastic Plate, Sheet and Shape Manufacturing             |
| 326140 | Polystyrene Foam Product Manufacturing                             |
| 326150 | Urethane and Other Foam Product (except Polystyrene) Manufacturing |
| 326160 | Plastic Bottle Manufacturing                                       |
| 326191 | Plastic Plumbing Fixture Manufacturing                             |
| 326193 | Motor Vehicle Plastic Parts Manufacturing                          |
| 326210 | Tire Manufacturing   |
| 326220 | Rubber and Plastic Hose and Belting Manufacturing                  |

**NON-METALLIC MINERAL PRODUCT MANUFACTURING**

|        |  |
|--------|--|
| 327110 | Pottery, Ceramics and Plumbing Fixture Manufacturing |
| 327120 | Clay Building Material and Refractory Manufacturing  |
| 327214 | Glass Manufacturing                                  |
| 327215 | Glass Product Manufacturing from Purchased Glass     |
| 327310 | Cement Manufacturing                                 |
| 327320 | Ready-Mix Concrete Manufacturing                     |
| 327330 | Concrete Pipe, Brick and Block Manufacturing         |
| 327410 | Lime Manufacturing                                   |
| 327420 | Gypsum Product Manufacturing                         |
| 327910 | Abrasive Product Manufacturing                       |

**IRON AND STEEL MILLS AND FERRO-ALLOY MANUFACTURING**

|        |  |
|--------|--|
| 331110 | Iron and Steel Mills and Ferro-Alloy Manufacturing |
|--------|--|

**STEEL PRODUCT MANUFACTURING FROM PURCHASED STEEL**

|        |   |
|--------|---|
| 331210 | Iron and Steel Pipes and Tubes Manufacturing from Purchased Steel |
| 331221 | Cold-Rolled Steel Shape Manufacturing                             |
| 331222 | Steel Wire Drawing  |

**ALUMINA AND ALUMINUM PRODUCTION AND PROCESSING**

|        |   |
|--------|---|
| 331313 | Primary Production of Alumina and Aluminum        |
| 331317 | Aluminum Rolling, Drawing, Extruding and Alloying |

| <b>SECTOR DESCRIPTION WITH NAICS* CODES</b>                          |   |
|--|---|
| <b>NON-FERROUS METAL (EXCEPT ALUMINUM) PRODUCTION AND PROCESSING</b> |   |
| 331410   | Non-Ferrous Metal (except Aluminum) Smelting and Refining                               |
| 331420   | Copper Rolling, Drawing, Extruding and Alloying   |
| 331490   | Non-Ferrous Metal (except Copper and Aluminum) Rolling, Drawing, Extruding and Alloying |
| <b>FOUNDRIES</b>   |   |
| 331511   | Iron Foundries  |
| 331514   | Steel Foundries   |
| 331523   | Non-Ferrous Die-Casting Foundries   |
| 331529   | Non-Ferrous Foundries (except Die-Casting)  |
| <b>FABRICATED METAL PRODUCT MANUFACTURING</b>                        |   |
| 332113   | Forging   |
| 332118   | Stamping  |
| 332210   | Cutlery and Hand Tool Manufacturing   |
| 332311   | Prefabricated Metal Building and Component Manufacturing                                |
| 332314   | Concrete Reinforcing Bar Manufacturing  |
| 332319   | Other Plate Work and Fabricated Structural Product Manufacturing                        |
| 332321   | Metal Window and Door Manufacturing   |
| 332410   | Power Boiler and Heat Exchanger Manufacturing   |
| 332420   | Metal Tank (Heavy Gauge) Manufacturing  |
| 332431   | Metal Can Manufacturing   |
| 332510   | Hardware Manufacturing  |
| 332611   | Spring (Heavy Gauge) Manufacturing  |
| 332619   | Other Fabricated Wire Product Manufacturing   |
| 332720   | Turned Product and Screw, Nut and Bolt Manufacturing                                    |
| 332810   | Coating, Engraving, Heat Treating and Allied Activities                                 |
| 332910   | Metal Valve Manufacturing   |
| 332991   | Ball and Roller Bearing Manufacturing   |
| <b>COMPUTER AND ELECTRONIC PRODUCT MANUFACTURING</b>                 |   |
| 334110   | Computer and Peripheral Equipment Manufacturing   |
| 334210   | Telephone Apparatus Manufacturing   |
| 334220   | Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing   |
| 334290   | Other Communications Equipment Manufacturing  |
| 334410   | Semiconductor and Other Electronic Component Manufacturing                              |
| 334511   | Navigational and Guidance Instruments Manufacturing                                     |
| 334512   | Measuring, Medical and Controlling Devices Manufacturing                                |
| 335110   | Electric Lamp Bulb and Parts Manufacturing  |
| 335120   | Lighting Fixture Manufacturing  |
| 335210   | Small Electrical Appliance Manufacturing  |
| 335223   | Major Kitchen Appliance Manufacturing   |
| 335311   | Power, Distribution and Specialty Transformers Manufacturing                            |
| 335312   | Motor and Generator Manufacturing   |

### SECTOR DESCRIPTION WITH NAICS\* CODES

|        |  |
|--------|--|
| 335315 | Switchgear and Switchboard, and Relay and Industrial Control Apparatus Manufacturing |
| 335910 | Battery Manufacturing  |
| 335920 | Communication and Energy Wire and Cable Manufacturing                                |
| 335930 | Wiring Device Manufacturing  |

### TRANSPORTATION EQUIPMENT MANUFACTURING

|        |  |
|--------|--|
| 336110 | Automobile and Light-Duty Motor Vehicle Manufacturing                          |
| 336120 | Heavy-Duty Truck Manufacturing   |
| 336211 | Motor Vehicle Body Manufacturing   |
| 336212 | Truck Trailer Manufacturing  |
| 336215 | Motor Home, Travel Trailer and Camper Manufacturing                            |
| 336310 | Motor Vehicle Gasoline Engine and Engine Parts Manufacturing                   |
| 336320 | Motor Vehicle Electrical and Electronic Equipment Manufacturing                |
| 336330 | Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing |
| 336340 | Motor Vehicle Brake System Manufacturing                                       |
| 336350 | Motor Vehicle Transmission and Power Train Parts Manufacturing                 |
| 336360 | Motor Vehicle Seating and Interior Trim Manufacturing                          |
| 336370 | Motor Vehicle Metal Stamping   |
| 336390 | Other Motor Vehicle Parts Manufacturing  |
| 336410 | Aerospace Product and Parts Manufacturing                                      |
| 336510 | Railroad Rolling Stock Manufacturing   |
| 336611 | Ship Building and Repairing  |
| 336612 | Boat Building  |
| 336990 | Other Transportation Equipment Manufacturing                                   |

### CLASS C - SMALL SOURCES

#### WATER, SEWAGE AND OTHER SYSTEMS

|        |                             |
|--------|-----------------------------|
| 221320 | Sewage Treatment Facilities |
|--------|-----------------------------|

#### FOOD MANUFACTURING (FOR ANIMAL CONSUMPTION)

|        |                                 |
|--------|---------------------------------|
| 311111 | Dog and Cat Food Manufacturing  |
| 311119 | Other Animal Food Manufacturing |

#### FOOD MANUFACTURING (FOR HUMAN CONSUMPTION)

*This sector applies to facilities using food ingredients which are subject to the Canadian Food and Drug Act in the manufacturing of products for human consumption, who:*

*a) derive <50% revenues from annual retail sales on premises; OR*

*b) utilize combustion with the maximum rated heat input capacity > 10 MMBTU/hour burning fuel other than coal, wood or waste oil.*

|        |  |
|--------|--|
| 311211 | Flour Milling  |
| 311214 | Rice Milling and Malt Manufacturing                        |
| 311221 | Wet Corn Milling   |
| 311224 | Oilseed Processing   |
| 311225 | Fat and Oil Refining and Blending                          |
| 311230 | Breakfast Cereal Manufacturing                             |
| 311310 | Sugar Manufacturing  |
| 311320 | Chocolate and Confectionery Manufacturing from Cacao Beans |

| SECTOR DESCRIPTION WITH NAICS* CODES            |   |
|---|---|
| 311330  | Confectionery Manufacturing from Purchased Chocolate                                  |
| 311340  | Non-Chocolate Confectionery Manufacturing   |
| 311410  | Frozen Food Manufacturing   |
| 311420  | Fruit and Vegetable Canning, Pickling and Drying                                      |
| 311511  | Fluid Milk Manufacturing  |
| 311515  | Butter, Cheese, and Dry and Condensed Dairy Products Manufacturing                    |
| 311520  | Ice Cream and Frozen Dessert Manufacturing  |
| 311614  | Rendering and Meat Processing from Carcasses  |
| 311615  | Poultry Processing  |
| 311710  | Seafood Product Preparation and Packaging   |
| 311814  | Commercial Bakeries and Frozen Bakery Product Manufacturing                           |
| 311821  | Cookie and Cracker Manufacturing  |
| 311822  | Flour Mixes and Dough Manufacturing from Purchased Flour                              |
| 311823  | Dry Pasta Manufacturing   |
| 311830  | Tortilla Manufacturing  |
| 311911  | Roasted Nut and Peanut Butter Manufacturing   |
| 311919  | Other Snack Food Manufacturing  |
| 311920  | Coffee and Tea Manufacturing  |
| 311930  | Flavouring Syrup and Concentrate Manufacturing  |
| 311940  | Seasoning and Dressing Manufacturing  |
| 312110  | Soft Drink and Ice Manufacturing  |
| 312120  | Breweries   |
| 312130  | Wineries  |
| 312140  | Distilleries  |
| <b>TOBACCO MANUFACTURING</b>                    |   |
| 312210  | Tobacco Stemming and Redrying   |
| 312220  | Tobacco Product Manufacturing   |
| <b>LEATHER AND ALLIED PRODUCT MANUFACTURING</b> |   |
| 316110  | Leather and Hide Tanning and Finishing  |
| 316210  | Footwear Manufacturing  |
| 316990  | Other Leather and Allied Product Manufacturing  |
| <b>MACHINERY MANUFACTURING</b>                  |   |
| 333110  | Agricultural Implement Manufacturing  |
| 333120  | Construction Machinery Manufacturing  |
| 333130  | Mining and Oil and Gas Field Machinery Manufacturing                                  |
| 333210  | Sawmill and Woodworking Machinery Manufacturing                                       |
| 333220  | Rubber and Plastics Industry Machinery Manufacturing                                  |
| 333291  | Paper Industry Machinery Manufacturing  |
| 333310  | Commercial and Service Industry Machinery Manufacturing                               |
| 333413  | Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing |
| 333416  | Heating Equipment and Commercial Refrigeration Equipment Manufacturing                |

## SECTOR DESCRIPTION WITH NAICS\* CODES

- 333511 Industrial Mould Manufacturing
- 333519 Other Metalworking Machinery Manufacturing
- 333611 Turbine and Turbine Generator Set Unit Manufacturing
- 333619 Other Engine and Power Transmission Equipment Manufacturing
- 333910 Pump and Compressor Manufacturing
- 333920 Material Handling Equipment Manufacturing

### **FURNITURE AND RELATED PRODUCT MANUFACTURING**

- 337110 Wood Kitchen Cabinet and Counter Top Manufacturing
- 337121 Upholstered Household Furniture Manufacturing
- 337123 Other Wood Household Furniture Manufacturing
- 337126 Household Furniture (except Wood and Upholstered) Manufacturing
- 337127 Institutional Furniture Manufacturing
- 337213 Wood Office Furniture, including Custom Architectural Woodwork, Manufacturing
- 337214 Office Furniture (except Wood) Manufacturing
- 337215 Showcase, Partition, Shelving and Locker Manufacturing
- 337910 Mattress Manufacturing
- 337920 Blind and Shade Manufacturing

### **TRANSPORTATION OPERATION**

*(For maintenance and repair yard only)*

- 485110 Urban Transit Systems
- 485210 Inter-urban and Rural Bus Transportation

### **COMMERCIAL BUILDINGS**

*(Commercial buildings include office buildings, hotels, shopping centres. Report SO<sub>2</sub>, NO<sub>x</sub>, and HFC-134A emissions from heating or cooling systems if the emissions are equal to or greater than their respective reporting thresholds)*

- 531120 Lessors (or Owners) of Non-Residential Buildings (except Mini-Warehouses)

### **TESTING LABORATORIES**

*(For product development and testing only)*

- 541380 Testing Laboratories

### **WASTE MANAGEMENT AND REMEDIATION SERVICES**

- 562110 Waste Collection
- 562210 Waste Treatment and Disposal
- 562910 Remediation Services
- 562920 Material Recovery Facilities
- 562990 All Other Waste Management Services

### **EDUCATIONAL SERVICES**

*(For universities, report SO<sub>2</sub>, NO<sub>x</sub>, and HFC-134A emissions from heating or cooling systems if the emissions are equal to or greater than their respective reporting thresholds)*

- 611310 Universities

## SECTOR DESCRIPTION WITH NAICS\* CODES

### HEALTH CARE

(For hospitals with incinerators only)

622111 General (except Paediatric) Hospitals

622112 Paediatric Hospitals

622210 Psychiatric and Substance Abuse Hospitals

622310 Specialty (except Psychiatric and Substance Abuse) Hospitals

### AUTO REPAIR SERVICES

811121 Automotive Body, Paint and Interior Repair and Maintenance

### DRY CLEANING AND LAUNDRY SERVICES

(For bulk dry cleaning depots/plants only)

812320 Dry Cleaning and Laundry Services (except Coin-Operated)

### CLASS C - SMALL SOURCES

#### MISCELLANEOUS

### OIL AND GAS EXTRACTION

211113 Conventional Oil and Gas Extraction

211114 Non-Conventional Oil Extraction

### COAL MINING

212114 Bituminous Coal Mining

212115 Sub-bituminous Coal Mining

212116 Lignite Coal Mining

### NON-METALLIC MINERALS MINING AND QUARRYING

212392 Diamond Mining

212393 Salt Mining

212397 Peat Extraction

212398 All Other Non-Metallic Mineral Mining and Quarrying

### SUPPORT ACTIVITIES FOR MINING AND OIL AND GAS EXTRACTION

213111 Oil and Gas Contract Drilling

213117 Contract Drilling (except Oil and Gas)

213118 Services to Oil and Gas Extraction

213119 Other Support Activities for Mining

### ELECTRIC POWER TRANSMISSION AND DISTRIBUTION

221121 Electric Bulk Power Transmission and Control

221122 Electric Power Distribution

### FOOD MANUFACTURING (FOR HUMAN CONSUMPTION)

This sector applies to facilities using food ingredients which are subject to the Canadian Food and Drug Act in the manufacturing of products for human consumption, who:

a) derive <50% revenues from annual retail sales on premises; OR

b) utilize combustion with the maximum rated heat input capacity > 10 MMBTU/hour burning fuel other than coal, wood or waste oil.

311611 Animal (except Poultry) Slaughtering

311990 All Other Food Manufacturing

## SECTOR DESCRIPTION WITH NAICS\* CODES

### TEXTILE MILLS AND TEXTILE MILL PRODUCTS

- 313220 Narrow Fabric Mills and Schiffli Machine Embroidery
- 313230 Non-woven Fabric Mills
- 313240 Knit Fabric Mills
- 314120 Curtain and Linen Mills
- 314910 Textile Bag and Canvas Mills
- 314990 All Other Textile Product Mills

### CLOTHING MANUFACTURING

- 315110 Hosiery and Sock Mills
- 315190 Other Clothing Knitting Mills
- 315210 Cut and Sew Clothing Contracting
- 315221 Men's and Boys' Cut and Sew Underwear and Nightwear Manufacturing
- 315222 Men's and Boys' Cut and Sew Suit, Coat and Overcoat Manufacturing
- 315226 Men's and Boys' Cut and Sew Shirt Manufacturing
- 315227 Men's and Boys' Cut and Sew Trouser, Slack and Jean Manufacturing
- 315229 Other Men's and Boys' Cut and Sew Clothing Manufacturing
- 315231 Women's and Girls' Cut and Sew Lingerie, Loungewear and Nightwear Manufacturing
- 315232 Women's and Girls' Cut and Sew Blouse and Shirt Manufacturing
- 315233 Women's and Girls' Cut and Sew Dress Manufacturing
- 315234 Women's and Girls' Cut and Sew Suit, Coat, Tailored Jacket and Skirt Manufacturing
- 315239 Other Women's and Girls' Cut and Sew Clothing Manufacturing
- 315291 Infants' Cut and Sew Clothing Manufacturing
- 315292 Fur and Leather Clothing Manufacturing
- 315299 All Other Cut and Sew Clothing Manufacturing
- 315990 Clothing Accessories and Other Clothing Manufacturing

### WOOD PRODUCT MANUFACTURING

- 321919 Other Millwork
- 321920 Wood Container and Pallet Manufacturing
- 321991 Manufactured (Mobile) Home Manufacturing
- 321992 Prefabricated Wood Building Manufacturing
- 321999 All Other Miscellaneous Wood Product Manufacturing

### CONVERTED PAPER PRODUCT MANUFACTURING

- 322299 All Other Converted Paper Product Manufacturing

### PRINTING AND RELATED SUPPORT ACTIVITIES

- 323114 Quick Printing
- 323115 Digital Printing
- 323120 Support Activities for Printing

### PLASTICS AND RUBBER PRODUCTS MANUFACTURING

- 326198 All Other Plastic Product Manufacturing
- 326290 Other Rubber Product Manufacturing

| SECTOR DESCRIPTION WITH NAICS* CODES                                      |  |
|---|--|
| <b>NON-METALLIC MINERAL PRODUCT MANUFACTURING</b>                         |  |
| 327390  | Other Concrete Product Manufacturing                                       |
| 327990  | All Other Non-Metallic Mineral Product Manufacturing                       |
| <b>FABRICATED METAL PRODUCT MANUFACTURING</b>                             |  |
| 332329  | Other Ornamental and Architectural Metal Products Manufacturing            |
| 332439  | Other Metal Container Manufacturing  |
| 332710  | Machine Shops  |
| 332999  | All Other Miscellaneous Fabricated Metal Product Manufacturing             |
| <b>MACHINERY MANUFACTURING</b>  |  |
| 333299  | All Other Industrial Machinery Manufacturing                               |
| 333990  | All Other General-Purpose Machinery Manufacturing                          |
| <b>COMPUTER AND ELECTRONIC PRODUCT MANUFACTURING</b>                      |  |
| 334310  | Audio and Video Equipment Manufacturing                                    |
| 334610  | Manufacturing and Reproducing Magnetic and Optical Media                   |
| 335229  | Other Major Appliance Manufacturing  |
| 335990  | All Other Electrical Equipment and Component Manufacturing                 |
| <b>OTHER MISCELLANEOUS MANUFACTURING</b>                                  |  |
| 339110  | Medical Equipment and Supplies Manufacturing                               |
| 339910  | Jewellery and Silverware Manufacturing                                     |
| 339920  | Sporting and Athletic Goods Manufacturing                                  |
| 339930  | Doll, Toy and Game Manufacturing   |
| 339940  | Office Supplies (except Paper) Manufacturing                               |
| 339950  | Sign Manufacturing   |
| 339990  | All Other Miscellaneous Manufacturing                                      |
| <b>MISCELLANEOUS WHOLESALER-DISTRIBUTORS</b>                              |  |
| 418190  | Other Recyclable Material Wholesaler-Distributors                          |
| 418410  | Chemical (except Agricultural) and Allied Product Wholesaler-Distributors  |
| <b>TRANSPORTATION OPERATION</b><br>(For maintenance and repair yard only) |  |
| 481110  | Scheduled Air Transportation   |
| 481214  | Non-Scheduled Chartered Air Transportation                                 |
| 481215  | Non-Scheduled Specialty Flying Services                                    |
| 482112  | Short-Haul Freight Rail Transportation                                     |
| 482113  | Mainline Freight Rail Transportation                                       |
| 482114  | Passenger Rail Transportation  |
| 483115  | Deep Sea, Coastal and Great Lakes Water Transportation (except by Ferries) |
| 483116  | Deep Sea, Coastal and Great Lakes Water Transportation by Ferries          |
| 486110  | Pipeline Transportation of Crude Oil                                       |
| 486210  | Pipeline Transportation of Natural Gas                                     |
| 486910  | Pipeline Transportation of Refined Petroleum Products                      |
| 486990  | All Other Pipeline Transportation  |

## SECTOR DESCRIPTION WITH NAICS\* CODES

### SUPPORT ACTIVITIES FOR TRANSPORTATION

- 488111 Air Traffic Control
- 488119 Other Airport Operations
- 488190 Other Support Activities for Air Transportation
- 488210 Support Activities for Rail Transportation
- 488390 Other Support Activities for Water Transportation
- 488490 Other Support Activities for Road Transportation
- 488519 Other Freight Transportation Arrangement

### PROFESSIONAL, SCIENTIFIC AND TECHNICAL SERVICES

- 541990 All Other Professional, Scientific and Technical Services

### ADMINISTRATIVE AND SUPPORT SERVICES

- 561990 All Other Support Services

### EDUCATIONAL SERVICES

*(For colleges of applied arts and technology, report SO<sub>2</sub>, NO<sub>x</sub>, and HFC-134A emissions from heating or cooling systems if they are equal to or greater than their respective reporting thresholds)*

- 611210 Community Colleges and C.E.G.E.P.s (collège d'enseignement générales et professionnelles)

### PHOTO FINISHING SERVICES

*(For commercial and professional photo finishing laboratories on a large scale basis)*

- 812921 Photo Finishing Laboratories (except One-Hour)

## Appendix 2

| <b>Airborne Contaminants with MOE Release Based Thresholds</b> |                    |                              |
|--|--------------------|------------------------------|
| Contaminant  | CAS <sup>[1]</sup> | Release Threshold<br>(kg/yr) |
| CARBON DIOXIDE (CO <sub>2</sub> )                              | 124-38-9           | 100,000,000                  |
| CARBON MONOXIDE (CO)   | 630-08-0           | 20,000                       |
| HFC-134A   | 811-97-2           | 10                           |
| METHANE (CH <sub>4</sub> )                                     | 74-82-8            | 5,000,000                    |
| NITROUS OXIDE (N <sub>2</sub> O)                               | 10024-97-2         | 2,700                        |
| OXIDES OF NITROGEN (EXPRESSED AS NO)                           | 10102-43-9         | 14,000                       |
| PM - PARTICULATE MATTER  | N/A - M08          | 20,000                       |
| PM <sub>10</sub> - PARTICULATE MATTER $\leq$ 10 MICROMETERS    | N/A - M09          | 500                          |
| PM <sub>2.5</sub> - PARTICULATE MATTER $\leq$ 2.5 MICROMETERS  | N/A - M10          | 300                          |
| SULPHUR DIOXIDE (SO <sub>2</sub> )                             | 7446-09-5          | 20,000                       |
| VOLATILE ORGANIC COMPOUNDS (VOCs) <sup>[20]</sup>              | N/A - M16          | 10,000                       |
|  |                    | Total Contaminants: 11       |

N/A - Refer to comments in Notes to Appendices 2 and 3

MOE - Ministry of the Environment

CAS - Chemical Abstracts Service registry number

kg/yr - kilograms per year

HFC - hydrofluorocarbon

### Appendix 3

#### Airborne Contaminants with MOE Graded MPO<sup>[22]</sup> Thresholds

| Contaminant                              | CAS <sup>[1]</sup> | MPO <sup>[22]</sup> Threshold (kg/yr) |
|--|--------------------|---------------------------------------|
| ACETIC ACID                              | 64-19-7            | 3,000                                 |
| ACETONE                                  | 67-64-1            | 3,000                                 |
| ACETYLENE                                | 74-86-2            | 3,000                                 |
| BORON                                    | 7440-42-8          | 3,000                                 |
| BORON TRIBROMIDE                         | 10294-33-4         | 3,000                                 |
| BORON TRICHLORIDE                        | 10294-34-5         | 3,000                                 |
| CALCIUM HYDROXIDE                        | 1305-62-0          | 3,000                                 |
| CALCIUM OXIDE                            | 1305-78-8          | 3,000                                 |
| DECABORANE                               | 17702-41-9         | 3,000                                 |
| DICAPRYL PHTHALATE                       | 131-15-7           | 3,000                                 |
| 1,1-DICHLOROETHANE                       | 75-34-3            | 3,000                                 |
| DIMETHYL DISULPHIDE                      | 624-92-0           | 3,000                                 |
| DIMETHYL SULPHIDE                        | 75-18-3            | 3,000                                 |
| ETHYL ACETATE                            | 141-78-6           | 3,000                                 |
| ETHYL ETHER                              | 60-29-7            | 3,000                                 |
| FERRIC OXIDE                             | 1309-37-1          | 3,000                                 |
| FURFURAL                                 | 98-01-1            | 3,000                                 |
| FURFURYL ALCOHOL                         | 98-00-0            | 3,000                                 |
| GLYCOL ETHERS (MISC.) <sup>[18]</sup>    | N/A - M04          | 3,000                                 |
| N-HEPTANE                                | 142-82-5           | 3,000                                 |
| IRON (AND ITS COMPOUNDS) <sup>[17]</sup> | 7439-89-6          | 3,000                                 |
| LITHIUM - OTHER THAN HYDRIDES            | 7439-93-2          | 3,000                                 |
| MAGNESIUM OXIDE                          | 1309-48-4          | 3,000                                 |
| MINERAL SPIRITS GROUP #1 <sup>[19]</sup> | N/A - M06          | 3,000                                 |
| MINERAL SPIRITS GROUP #2 <sup>[19]</sup> | N/A - M17          | 3,000                                 |
| PENTACHLORONITROBENZENE                  | 82-68-8            | 3,000                                 |
| TETRAHYDROFURAN                          | 109-99-9           | 3,000                                 |
| TIN (AND ITS COMPOUNDS) <sup>[17]</sup>  | 7440-31-5          | 3,000                                 |

N/A - Refer to comments in Notes to Appendices 2 and 3

MOE - Ministry of the Environment

MPO - Manufactured, Processed or Otherwise used

CAS - Chemical Abstracts Service registry number

**Airborne Contaminants with MOE Graded MPO<sup>[22]</sup> Thresholds**

| Contaminant  | CAS <sup>[1]</sup> | MPO <sup>[22]</sup> Threshold (kg/yr) |
|--|--------------------|---------------------------------------|
| TITANIUM (AND ITS COMPOUNDS) <sup>[17]</sup>       | 7440-32-6          | 3,000                                 |
| TOTAL REDUCED SULPHUR (TRS) <sup>[24]</sup>        | N/A - M14          | 3,000                                 |
| 1,1,1-TRICHLOROETHANE                              | 71-55-6            | 3,000                                 |
| 2,4,5-TRICHLOROPHENOL                              | 95-95-4            | 3,000                                 |
| 1,2,3-TRICHLOROPROPANE                             | 96-18-4            | 3,000                                 |
| VINYL BROMIDE                                      | 593-60-2           | 3,000                                 |
| VINYL FLOURIDE                                     | 75-02-5            | 3,000                                 |
| ARSINE   | 7784-42-1          | 500                                   |
| BENZIDINE  | 92-87-5            | 500                                   |
| BERYLLIUM (AND ITS COMPOUNDS)                      | 7440-41-7          | 500                                   |
| BIS (2-CHLOROETHYL) ETHER                          | 111-44-4           | 500                                   |
| BIS (CHLOROMETHYL) ETHER                           | 542-88-1           | 500                                   |
| CARBON BLACK                                       | 1333-86-4          | 500                                   |
| CHROMIUM (VI) COMPOUNDS                            | 18540-29-9         | 500                                   |
| COAL TAR PITCH VOLATILES - SOLUBLE FRACTION        | 8007-45-2          | 500                                   |
| COKE OVEN EMISSIONS <sup>[21]</sup>                | N/A - M02          | 500                                   |
| DIBORANE   | 19287-45-7         | 500                                   |
| 1,2-DIBROMOETHANE                                  | 106-93-4           | 500                                   |
| 3,3-DICHLOROBENZIDINE                              | 91-94-1            | 500                                   |
| 1,2-DIMETHYLHYDRAZINE                              | 57-14-7            | 500                                   |
| 1,6-DINITROPYRENE                                  | 42397-64-8         | 500                                   |
| 1,8-DINITROPYRENE                                  | 42397-65-9         | 500                                   |
| HEPTACHLOR   | 76-44-8            | 500                                   |
| HEXACHLORO-1,3-BUTADIENE                           | 87-68-3            | 500                                   |
| HEXACHLOROCYCLOHEXANE                              | 319-84-6           | 500                                   |
| HEXAMETHYLENE DIISOCYANATE MONOMER                 | 822-06-0           | 500                                   |
| LITHIUM HYDRIDES                                   | 7580-67-8          | 500                                   |
| MERCAPTANS (AS METHYL MERCAPTAN) -TOTAL            | 74-93-1            | 500                                   |
| METHYLCYCLOPENTADIENYL MANGANESE TRICARBONYL (MMT) | 12108-13-3         | 500                                   |

N/A - Refer to comments in Notes to Appendices 2 and 3

MOE - Ministry of the Environment

MPO - Manufactured, Processed or Otherwise used

CAS - Chemical Abstracts Service registry number

**Airborne Contaminants with MOE Graded MPO<sup>[22]</sup> Thresholds**

| Contaminant                               | CAS <sup>[1]</sup>  | MPO <sup>[22]</sup> Threshold (kg/yr) |
|---|---------------------|---------------------------------------|
| MINERAL SPIRITS GROUP #3 <sup>[19]</sup>  | N/A - M18           | 500                                   |
| MONOMETHYL AMINE                          | 74-89-5             | 500                                   |
| NICKEL CARBONYL                           | 13463-39-3          | 500                                   |
| N-NITROSODIETHYLAMINE                     | 55-18-5             | 500                                   |
| N-NITROSODIMETHYLAMINE                    | 62-75-9             | 500                                   |
| OCTACHLOROSTYRENE                         | 29082-74-4          | 500                                   |
| PARATHION                                 | 56-38-2             | 500                                   |
| PENTABORANE                               | 19624-22-7          | 500                                   |
| PENTACHLOROPHENOL (PCP)                   | 87-86-5             | 500                                   |
| POLYCHLORINATED BIPHENYLS (PCBS)          | 1336-36-3           | 500                                   |
| TELLURIUM - EXCLUDING HYDROGEN TELLURIDE  | 13494-80-9          | 500                                   |
| TRIBUTYLTIN                               | 688-73-3            | 500                                   |
| 2,4,6-TRICHLOROPHENOL                     | 88-06-2             | 500                                   |
| METHYL MERCURY                            | 22967-92-6          | 5                                     |
| PAH - ACENAPHTHENE                        | 83-32-9             | 5                                     |
| PAH - ACENAPHTHYLENE                      | 208-96-8            | 5                                     |
| PAH - FLUORENE                            | 86-73-7             | 5                                     |
| 2,3,7,8-TETRACHLORODIBENZOFURAN (TEQ)     | 51207-31-9          | 0.0001                                |
| 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TEQ) | 1746-01-6           | 0.0001                                |
|   | Total Contaminants: | 76                                    |

## Notes to Appendices 2 and 3

- \* No single CAS number applies to this NPRI listing.
- [1] CAS No. denotes the Chemical Abstracts Service Registry Number, as appropriate. MOE assigned codes denoted with "N/A - Mxx" to contaminants when no single CAS number applies to a specific contaminant.
- [2] "and its salts" — The CAS number corresponds to the weak acid or base. However, the NPRI listing includes the salts of these weak acids and bases. When calculating the weight of these substances and their salts, use the molecular weight of the acid or base, not the total weight of the salt.
- [3] "fume or dust"
- [4] "fibrous forms"
- [5] "Ammonia (total)" means the total of both of ammonia (NH<sub>3</sub> — CAS number 7664-41-7) and the ammonium ion (NH<sub>4</sub><sup>+</sup>) in solution.
- [6] "and its compounds"
- [7] " friable form"
- [8] "mixed isomers"
- [9] "ionic"
- [10] The isomers include, but are not necessarily limited to, HCFC-122 (CAS Number 354-21-2).
- [11] The isomers include, but are not necessarily limited to, HCFC-123 (CAS Number 306-83-2) and HCFC 123a (CAS Number 90454-18-5).
- [12] The isomers include, but are not necessarily limited to, HCFC 124 (CAS Number 2837-89-0) and HCFC 124a ( CAS Number 354-25-6).
- [13] "in solution at a pH of 6.0 or greater"
- [14] "yellow or white"
- [15] The reporting requirements for mercury have changed for the 2000 reporting year.
- [16] This class of substances is restricted to the following congeners:  
2,3,7,8-Tetrachlorodibenzo-p-dioxin (1746-01-6); 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (40321-76-4); 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (39227-28-6);  
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (19408-74-3); 1,2,3,6,7,8-Hexachloro-dibenzo-p-dioxin (57653-85-7); 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (35822-46-9);  
Octachlorodibenzo-p-dioxin (326-87-9); 2,3,7,8-Tetrachlorodibenzofuran (51207-31-9);  
2,3,4,7,8-Pentachlorodibenzofuran (57117-31-4); 1,2,3,7,8-Pentachlorodibenzofuran (57117-41-6); 1,2,3,4,7,8-Hexachlorodibenzofuran (70648-26-9); 1,2,3,7,8,9-Hexachlorodibenzofuran (72918-21-9); 1,2,3,6,7,8-Hexachlorodibenzofuran (57117-44-9);  
2,3,4,6,7,8-Hexachlorodibenzofuran (60851-34-5); 1,2,3,4,6,7,8-Heptachloro-dibenzo-furan (67562-39-4); 1,2,3,4,7,8,9-Heptachlorodibenzofuran (55673-89-7);  
and Octachlorodibenzofuran (39001-02-0).
- [17] Refers to the metal portion of the compounds emitted to the atmosphere. Reporting facilities are only required to report PM, PM<sub>10</sub>, and PM<sub>2.5</sub> components of fugitive dust emissions from storage piles, road dust, landfill sites, quarries and mine tailings.
- [18] Refer to Annex 1 to Appendix 3 for contaminants listed under glycol ethers (misc.). If one contaminant is equal to or greater than the threshold, then all contaminants in the group

## Notes to Appendices 2 and 3

, which are manufactured, processed, or otherwise used, must be reported. No emission value should be reported for contaminants that facilities do not manufacture, process or otherwise use.

- [19] Refer to Annex 2 to Appendix 3 for definitions of the three mineral spirits groups and their associated contaminants. If one contaminant in the group is equal to or greater than the threshold, then all contaminants in that group, which are manufactured, processed, or otherwise used, must be reported. No emission value should be reported for contaminants that facilities do not manufacture, process or otherwise use.
- [20] Refer to Annex 1 to Appendix 2 for the definition of VOCs.
- [21] "Coke oven emissions" means the emissions discharged to the atmosphere in the operation of coke oven batteries. Emissions will occur at charging, pushing or quenching operation, bypass, bleeder, and from coke oven doors. Organic compounds soluble in benzene are the major constituents of PM emissions and are also included as VOC. Among the toxic air pollutants included in the organic emissions are benzene, toluene, xylenes, cyanide compounds, naphthalene, phenol, and Polycyclic Organic Matters (POM), all of which are contained in coke oven emissions<sup>3</sup>. FIRE<sup>2</sup> has emission factors for coke oven emissions for pushing operation, oven door leaks and topside leaks.
- [22] MPO means manufactured, processed or otherwise used. By-products must be included in the calculation of the MPO reporting threshold (tonnes or kilograms), even if they are at a concentration of less than one percent by weight. A facility must report its air emissions if contaminants are equal to or greater than the MPO thresholds and the facility has employees that worked a total of 20,000 hours or more (which is equivalent to 10 full-time employees) during the reporting year.
- [23] National Pollutant Release Inventory, Environment Canada. Reporting requirements and thresholds as gazetted for the reporting year (also refer to NPRI<sup>16</sup> reporting guidelines for details). Record keeping requirements will be the same as in Table 7.
- [24] Total reduced sulphur (TRS) consists of hydrogen sulphide (H<sub>2</sub>S), dimethyl sulphide [(CH<sub>3</sub>)<sub>2</sub>S], dimethyl disulphide [(CH<sub>3</sub>)<sub>2</sub>S<sub>2</sub>] and methyl mercaptan (CH<sub>3</sub>SH).

## Annex 1 to Appendix 2

### Definition of Volatile Organic Compounds

For the purposes of this Guideline, volatile organic compounds (VOCs) are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions and has a vapour pressure of 0.01 kPa or greater at 25°C<sup>21, 22</sup>.

The following compounds are not included as VOCs because of their negligible photochemical reactivity<sup>22</sup>:

methane;  
ethane;  
methylene chloride (dichloromethane);  
1,1,1-trichloroethane (methyl chloroform);  
1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113);  
trichlorofluoromethane (CFC-11);  
dichlorodifluoromethane (CFC-12);  
chlorodifluoromethane (HCFC-22);  
trifluoromethane (HFC-23);  
1,2-dichloro 1,1,2,2-tetrafluoroethane (CFC-114);  
chloropentafluoroethane (CFC-115);  
1,1,1-trifluoro 2,2-dichloroethane (HCFC-123);  
1,1,1,2-tetrafluoroethane (HFC-134a);  
1,1-dichloro 1-fluoroethane (HCFC-141b);  
1-chloro 1,1-difluoroethane (HCFC-142b);  
2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124);  
pentafluoroethane (HFC-125);  
1,1,2,2-tetrafluoroethane (HFC-134);  
1,1,1-trifluoroethane (HFC-143a);  
1,1-difluoroethane (HFC-152a);  
parachlorobenzotrifluoride (PCBTF);  
cyclic, branched, or linear completely methylated siloxanes;  
acetone;  
perchloroethylene (tetrachloroethylene);  
3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca);  
1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb);  
1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee);  
difluoromethane (HFC-32);  
ethylfluoride (HFC-161);  
1,1,1,3,3-hexafluoropropane (HFC-236fa);  
1,1,2,2,3-pentafluoropropane (HFC-245ca);  
1,1,2,3,3-pentafluoropropane (HFC-245ea);  
1,1,1,2,3-pentafluoropropane (HFC-245eb);  
1,1,1,3,3-pentafluoropropane (HFC-245fa);  
1,1,1,2,3,3-hexafluoropropane (HFC-236ea);  
1,1,1,3,3-pentafluorobutane (HFC-365mfc);  
chlorofluoromethane (HCFC-31);  
1-chloro-1-fluoroethane (HCFC-151a);  
1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a);

1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane ( $C_4F_9OCH_3$ );  
2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane ( $(CF_3)_2CFCF_2OCH_3$ );  
1-ethoxy-1,1,2,2,3,3,4,4-nonafluorobutane ( $C_4F_9OC_2H_5$ );  
2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane ( $(CF_3)_2CFCF_2OC_2H_5$ );  
methyl acetate and perfluorocarbon compounds which falls into these classes:

- (i) Cyclic, branched, or linear, completely fluorinated alkanes;
- (ii) Cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
- (iii) Cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
- (iv) Sulphur containing perfluorocarbons with no unsaturations and with sulphur bonds only to carbon and fluorine.

Owing to the numerous VOC species, it is not possible to give an all inclusive list of atmospherically important VOCs. A list of VOC compounds based on Carter's <sup>23</sup> list of ozone forming potential contaminants, not including those in the aforementioned USEPA exclusion list, is available from the Ministry of the Environment's Public Information Centre upon request.

### Annex 1 to Appendix 3

| Contaminants Listed under Glycol Ethers | Abbreviation | CAS        |
|---|--------------|------------|
| ETHYLENE GLYCOL BUTYL ETHER             | EGBE         | 111-76-2   |
| ETHYLENE GLYCOL BUTYL ETHER ACETATE     | EGBEA        | 112-07-2   |
| DIETHYLENE GLYCOL BUTYL ETHER           | DEGBE        | 112-34-5   |
| DIETHYLENE GLYCOL BUTYL ETHER ACETATE   | DEBBeA       | 124-17-4   |
| DIETHYLENE GLYCOL METHYL ETHER          | DEGME        | 111-77-3   |
| DIETHYLENE GLYCOL METHYL ETHER ACETATE  | DEGMEA       | 629-38-9   |
| DIETHYLENE GLYCOL ETHYL ETHER           | DEGEE        | 111-90-0   |
| DIETHYLENE GLYCOL ETHYL ETHER ACETATE   | DEGEEA       | 112-15-2   |
| ETHYLENE GLYCOL PROPYL ETHER            | EGPE         | 2807-30-9  |
| ETHYLENE GLYCOL HEXYL ETHER             | EGHE         | 112-25-4   |
| 1-METHOXY-2-PROPANOL                    | PGME         | 107-98-2   |
| PROPYLENE GLYCOL METHYL ETHER ACETATE   | PGMEA        | 108-65-6   |
| PROPYLENE GLYCOL PROPYL ETHER           | PGPE         | 1569-01-3  |
| PROPYLENE GLYCOL BUTYL ETHER            | PGBE         | 5131-66-8  |
| PROPYLENE GLYCOL ETHYL ETHER            | PGEE         | 1569-02-4  |
| DIPROPYLENE GLYCOL METHYL ETHER         | DPGME        | 34590-34-8 |
| 2-METHOXY-1-PROPANOL                    | PGME         | 1589-47-5  |
| ETHYLENE GLYCOL PHENYL ETHER            | EGPhE        | 122-99-6   |

**Annex 2 to Appendix 3**

| <b>Definition of Three Mineral Spirits Groups and the Associated Contaminants</b> |            |
|---|------------|
| <b>MINERAL SPIRITS GROUP #1</b>   | <b>CAS</b> |
| HEAVY ALKYLATE NAPHTHA  | 64741-65-7 |
| HEAVY NAPHTHA   | 68551-17-7 |
| HYDROTREATED HEAVY NAPHTHA  | 64742-48-9 |
| MINERAL SPIRITS   | 64475-85-0 |
| NAPHTHA   | 8030-30-6  |
| NAPHTHA HEAVY STRAIGHT RUN  | 64741-41-9 |
| NAPHTHA, FULL RANGE ALKYLATE  | 64741-64-6 |
| SOLVENT NAPHTHA LIGHT ALIPHATIC   | 64742-89-8 |
| SOLVENT NAPHTHA MEDIUM ALIPHATIC  | 64742-88-7 |
| VM & P NAPHTHA  | 8032-32-4  |
| STODDARD SOLVENT  | 8052-41-3  |
| <b>MINERAL SPIRITS GROUP #2</b>   |            |
| HEAVY AROMATIC SOLVENT NAPHTHA  | 64742-94-5 |
| HYDRODESULPHURIZED MIDDLE Distillate  | 64742-80-9 |
| HYDROTREATED HEAVY NAPHTHENIC Distillate  | 64742-52-5 |
| HYDROTREATED LIGHT DISTILLATE   | 64742-47-8 |
| HYDROTREATED MIDDLE DISTILLATE  | 64742-46-7 |
| LIGHT AROMATIC SOLVENT NAPHTHA  | 64742-95-6 |
| PETROLEUM DISTILLATES, ACID TREATED   | 64742-14-9 |
| SWEETENED MIDDLE DISTILLATE   | 64741-86-2 |
| <b>MINERAL SPIRITS GROUP #3</b>   |            |
| HYDROTREATED HEAVY PARAFFINIC MINERAL SPIRITS                                     | 64742-54-7 |
| HYDROTREATED LIGHT NAPHTHENIC DISTILLATE  | 64742-53-6 |
| HYDROTREATED LIGHT PARAFFINIC DISTILLATE  | 64742-55-8 |
| MINERAL OIL   | 8012-95-1  |
| SOLVENT REFINED HEAVY PARAFFINIC DISTILLATE                                       | 64741-88-4 |
| WHITE MINERAL OIL   | 8042-47-5  |

## **Appendix 4: Contact**

### **For the Ontario Ministry of the Environment:**

Nicholas Ting, P.Eng.  
Supervisor of Emissions Inventory  
Environmental Monitoring and Reporting Branch  
Ontario Ministry of the Environment  
125 Resources Road  
Etobicoke, Ontario  
M9P 3V6  
Tel.: (416) 235-5772  
Fax: (416) 235-5818  
E-mail [TINGNI@ene.gov.on.ca](mailto:TINGNI@ene.gov.on.ca)

A help desk has been set up for those who have to report under Ontario's air monitoring and reporting regulation (O. Reg. 127/01) and Environment Canada's National Pollutant Release Inventory (NPRI). This joint Ontario Ministry of the Environment-Environment Canada help desk may be accessed through:

Telephone: (416) 739-4707  
Fax: (416) 739-4762  
E-mail: [npri\\_onair@ec.gc.ca](mailto:npri_onair@ec.gc.ca)

*Oxford.*  
—  
ESSELTE



10%

